

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
17 March 2005 (17.03.2005)

PCT

(10) International Publication Number
WO 2005/025047 A1

(51) International Patent Classification⁷: **H02P 6/00, 5/41**

(21) International Application Number:
PCT/JP2004/010091

(22) International Filing Date: 8 July 2004 (08.07.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
2003-204733 31 July 2003 (31.07.2003) JP

(71) Applicant (for all designated States except US): **TOYOTA JIDOSHA KABUSHIKI KAISHA** [JP/JP]; 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **OKAMURA, Masaki** [JP/JP]; c/o Toyota Jidosha Kabushiki Kaisha, 1, Toyota-cho, Toyota-shi, Aichi 4718571 (JP). **YAMASHITA, Takashi** [JP/JP]; c/o Denso Corporation, 1-1, Showa-cho, Kariya-shi, Aichi 4488661 (JP).

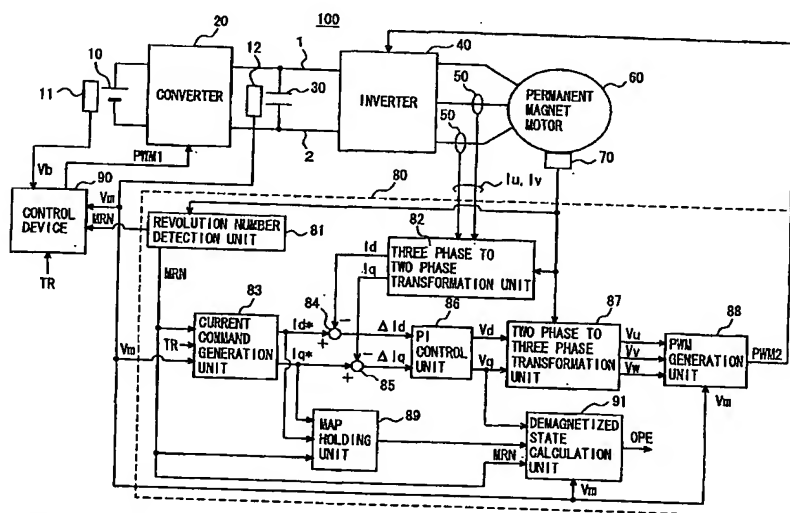
(74) Agents: **FUKAMI, Hisao** et al.; Fukami Patent Office, Mitsui Sumitomo Bank Minamimorimachi Bldg., 1-29, Minamimorimachi 2-chome, Kita-ku, Osaka-shi, Osaka 5300054 (JP).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: **MOTOR DRIVE APPARATUS CAPABLE OF ACCURATELY ESTIMATING DEMAGNETIZATION OF PERMANENT MAGNET MOTOR**



(57) Abstract: A map holding unit (89) holds, in the form of a map, a voltage control amount (V_{q_map}) of the q axis in a case where no demagnetization of a permanent magnet motor (60) occurs. Based on a motor revolution number, namely the number of revolutions of the motor (MRN) provided from a revolution number detection unit (81), a demagnetized state calculation unit (91) calculates a rotational angular velocity (ω). Then, based on the voltage control amount (V_{q_map}) from the map holding unit (89), a demagnetized state calculation unit (91) calculates an amount of demagnetization ($P(V_{q_map} - V_q) / \omega$) and outputs, if the amount of demagnetization is greater than a predetermined value, an operation signal (OPE) for controlling the operation of the permanent magnet motor (60).



Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.